

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS:**

Claims 1 - 3 (Canceled)

4. (Previously Presented) An infrared imaging apparatus comprising:
  - a dewar, having an internal volume that defines a cold space;
  - an IR transmissive window that seals the cold space to receive IR energy directly from an IR source;
  - a first lens located within the cold space to receive IR energy directly from the IR transmissive window;
  - an IR detector located within the cold space in operational communication with the first lens and positioned coincident to the focal plane of at least a first and second wavelength of IR energy; and
  - an optical stop located within the cold space in front of the single lens, wherein the single lens has a first aspheric profile on a first side and a second aspheric profile on a second side, the first side parallel to the second side and the second side facing the detector,
  - wherein the second aspheric profile has a holographic optical element, and
  - wherein the holographic optical element color corrects at least two color bands of infrared energy.

5. (Currently Amended) The infrared imaging apparatus of claim 4, wherein the holographic optical element color corrects a ~~red~~ first MWIR band and a ~~blue~~ second MWIR band, wherein the first MWIR band includes wavelengths of 3 to 5 microns and the second MWIR band includes wavelengths of 3 to 5 microns, the first MWIR band wavelengths differing from the second MWIR band wavelengths.

6. (Previously Presented) The infrared imaging apparatus of claim 4, wherein the detector is a hyperspectral detector.

7. (Previously Presented) The infrared imaging apparatus of claim 4, wherein the detector detects at least three wavelengths of IR energy including at least one LWIR band of energy.

8. (Currently Amended) The infrared imaging apparatus of claim ~~7~~ 5, wherein the detector detects at least three wavelengths of IR energy including at least one LWIR band of energy, and wherein the LWIR band of energy is ~~preferably at an indigo LWIR band~~ includes wavelengths of 8 to 12 microns.

9. (Previously Presented) The infrared imaging apparatus of claim 4, wherein the holographic optical element coincidentally focuses a MWIR band and a LWIR band of IR energy at a common focal plane.

10. (Previously Presented) The infrared imaging apparatus of claim 4, wherein the second wavelength of IR energy is a harmonic component of the first wavelength.

11. (Previously Presented) The infrared imaging apparatus of claim 4, wherein the single lens is made of germanium.

12. (Previously Presented) The infrared imaging apparatus of claim 4, wherein the single lens is made of silicon.

13. (Previously Presented) The infrared imaging apparatus of claim 4, wherein the apparatus performs at an F-stop ( $F/\#$ ) of at least 1.4 with a square field of view of 90x90 degrees.

14. (Previously Presented) The infrared imaging apparatus of claim 4, wherein the detector concurrently collects radiation from multiple, adjacent spectral radiation bands.

15. (Previously Presented) The infrared imaging apparatus of claim 4, wherein the first aspheric surface has the following prescription:

radius = -0.94467;

k = 28.345216;

a = -2.13952;

b = -69.5274;

$c = 2342.04$ ;  
 $d = -56841.9$ ; and  
first surface thickness =  $0.548467$ .

16. (Original) The infrared imaging apparatus of claim 15, wherein the second aspheric surface has the following prescription:

radius =  $-0.61281$ ;  
 $k = 0.1399$ ;  
 $a = 0.033459$ ;  
 $b = -2.3598$ ;  
 $c = 10.889$ ;  
 $d = -36.331$ ; and  
second surface thickness =  $0.462731$ .

17. (Original) The infrared imaging apparatus of claim 16, wherein the holographic optical element has the following prescription:

$-0.0051393, -0.10212, 0.91035, -2.3946$ .

18. (Previously Presented) The infrared imaging apparatus of claim 4, wherein the first aspheric surface has the following prescription:

radius =  $-1.23508$ ;  
 $k = 36.049455$ ;  
 $a = -1.69104$ ;  
 $b = -98.6413$ ;

$c = 5589.83$ ;

$d = -162359$ ; and

first surface thickness =  $0.761661$ .

19. (Original) The infrared imaging apparatus of claim 18, wherein the second aspheric surface has the following prescription:

radius =  $-0.81270$ ;

$k = -0.10748$ ;

$a = 0.054475$ ;

$b = -0.72423$ ;

$c = 2.9155$ ;

$d = -7.8939$ ; and

second surface thickness =  $0.480234$ .

20. (Original) The infrared imaging apparatus of claim 19, wherein the holographic optical element has the following prescription:

$-0.017112$ ,  $-0.038991$ ,  $0.55069$ ,  $-1.6405$ .